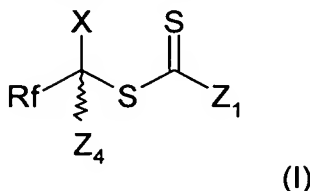


CLAIMS

1. Compound having the general formula (I):



in which

- X represents a group which donates by mesomeric effect;
- Z₁ represents a group selected from:

(i) the alkyl, acyl, aryl, aralkyl, alkene or alkyne groups, the cyclic hydrocarbons or the heterocycles,

(ii) a -OR^a or -SR^a group in which R^a is a group selected from :

- an alkyl, halogenoalkyl, alkenyl, alkynyl, acyl, aryl, arylalkyl, arylalkenyl, arylalkynyl group, or a cyclic hydrocarbon or a heterocycle, or a polymer chain;
- a -CR^bR^cPO(OR^d)(OR^e) group in which :
 - R^b and R^c each represent, independently of each other, a hydrogen atom, a halogen atom, an alkyl group, perfluoroalkyl, a cyclic hydrocarbon or a heterocycle, or an -NO₂, -NCO, CN group, or a group selected from groups of the type -R^f, -SO₃R^f, -OR^f, -SR^f, -NR^fR^g, -COOR^f, -O₂CR^f, -CONR^fR^g, -NCOR^fR^g, in which R^f and R^g each independently refer to an alkyl, alkenyl, alkynyl, cycloalkenyl, cycloalkynyl, aryl group which is optionally condensed to a heterocycle, alkaryl, arylalkyl, heteroaryl,
 - or R^b and R^c form, together with the carbon atom to which they are attached, a C=O or C=S group or a cyclic hydrocarbon or a heterocycle; and

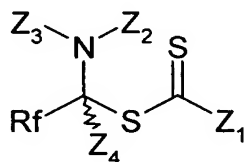
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PAGE 30-31-32

- R^d and R^e each represent, independently of each other, a radical which complies with one of the definitions given above for the group R^f ;
 - or R^d and R^e together form a hydrocarbon chain which comprises from 2 to 4 carbon atoms, and which is optionally interrupted by a group selected from $-O-$, $-S-$ and $-NR^h-$; in which R^h complies with one of the definitions given above for the group R^f ;
- (iii) a group $-NR^iR^j$, in which:
- R^i and R^j represent, independently of each other, a radical selected from an alkyl, halogenoalkyl, alkenyl, alkynyl, acyl, ester, aryl, arylalkyl, arylalkenyl, arylalkynyl group, or a cyclic hydrocarbon or a heterocycle; or
 - R^i and R^j together form a hydrocarbon chain which comprises from 2 to 4 carbon atoms and which is optionally interrupted by a O, S, or $-NR^h$, or R^h group which complies with one of the definitions given above for the R^f group,
- Z_4 represents a hydrogen atom, an alkyl or cycloalkyl group, and
- R_f represents
- (i) a halogen atom, preferably fluorine;
 - (ii) fluoroalkyl;
 - (iii) a poly- or per-halogenated aryl radical, or
 - (iv) a radical selected from R_A-CF_2- , $R_A-CF_2-CF_2-$, $R_A-CF_2-CF(CF_3)-$, $CF_3-C(R_A)F-$ and $(CF_3)R_A-$, with R_A selected from an alkyl, acyl, aryl, aralkyl, alkene or alkyne group, the cyclic hydrocarbons or the heterocycles,

and the salts of compounds of this type.

2. Compound according to claim 1, characterised in that X represents a $-NZ_2Z_3$, $-OZ_5$ group or a halogen atom (Hal), in which
- Z_2 and Z_3 represent, independently of each other, a hydrogen atom, a group selected from the alkyls, cycloalkyls, aryls and the electroattractive groups, it being understood that at least one of the radicals Z_2 and Z_3 advantageously has an electroattractive effect with respect to the electron density of the nitrogen atom to which they are bonded,
 - Z_2 and Z_3 can be bonded in order to form a heterocycle with the nitrogen atom,
 - Z_5 represents a hydrogen atom, a group selected from the alkyls, cycloalkyls, aryls or the groups which are electroattractive with respect to the electron density of the oxygen atom to which it is bonded.

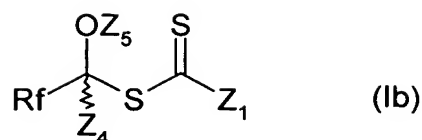
3. Compound according to claim 2, characterised in that it complies with the general formula (Ia):



Formula (Ia)

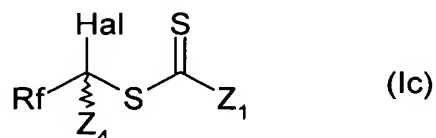
in which Z_1 , Z_2 , Z_3 , Z_4 and R_f are as defined in claims 1 to 2.

4. Compound according to claim 3, in which Z_2 and Z_3 represent, independently of each other, a hydrogen atom, a group selected from the alkyls, cycloalkyls, aryls, and the electroattractive groups, it being understood that at least one of the radicals Z_2 and Z_3 advantageously has an electroattractive effect with respect to the electron density of the nitrogen atom to which they are bonded.
5. Compound according to claim 2, characterised in that it complies with the general formula (Ib):



in which Z_1 , Z_4 , Z_5 and Rf are as defined in claims 1 to 2.

6. Compound according to claim 2, characterised in that it complies with the general formula (Ic):



in which Rf , Z_1 , Z_4 and Hal are as defined in claims 1 to 2.

7. Compound according to any one of the preceding claims, characterised in that Z_4 is a hydrogen atom.

8. Compound according to any one of the preceding claims, characterised in that Rf is a perfluoroalkyl group or a poly- or per-halogenated aryl radical comprising at least one fluorine atom.

9. Compound according to claim 8, characterised in that the perfluoroalkyl group is the trifluoromethyl radical.

10. Compound according to any one of claims 2 to 5 and 7 to 9, characterised in that Z_5 or at least one of the groups Z_2 and Z_3 represents an electroattractive group, such as the acyl, aroyl, carboxyl, alkyloxycarbonyl, aryloxycarbonyl, aralkyloxycarbonyl, carbamoyl, alkylcarbamoyl, arylcarbamoyl, cyano-, sulphonyl, alkylsulphonyl, arylsulphonyl groups.

11. Compound according to claim 10, characterised in that Z_5 or at least one of the groups Z_2 and Z_3 represents an electroattractive acyl, alkyloxycarbonyl or aralkyloxycarbonyl group.

12. Compound according to claim 11, characterised in that the electroattractive group is selected from the acetyl, t-butoxycarbonyl and benzyloxycarbonyl groups.

13. Compound according to any one of claims 10 to 12, characterised in that the other group Z_2 or Z_3 represents a hydrogen atom.

14. Compound according to any one of the preceding claims, characterised in that Z_1 represents a $-OR^a$, R^a group as defined in claim 1.

15. Compound according to any one of the preceding claims, characterised in that R^a represents an alkyl group.

16. Compound according to any one of claims 2, 6 to 9, 14 and 15, characterised in that the Hal group is a chlorine atom.

17. Compound according to any one of claims 2, 5, 7 to 9, 14 and 15, characterised in that Z_5 is a hydrogen atom.

18. Compound according to any one of the preceding claims, characterised in that it is:

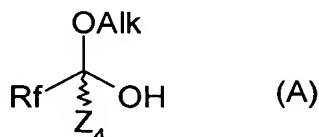
- S-[1-(N-acetylamino)-2,2,2-trifluoroethyl]-O-ethyl dithiocarbonate;
- O-ethyl and S-1-benzoylamino-2,2,2-trifluoro-ethyl diester of dithiocarbonic acid;
- O-ethyl and S-(1-hydroxy-2,2,2-trifluoro-ethyl) ester of dithiocarbonic acid;
- O-ethyl and S-(1-acetyl-2,2,2-trifluoro-ethyl) ester of dithiocarbonic acid;
- 1-ethoxythiocarbonylsulphonyl-2,2,2-trifluoro-ethyl ester of benzoic acid;
- O-ethyl and S-1-chloro-2,2,2-trifluoro-ethyl ester of dithiocarbonic acid.

19. Method for preparing a compound having the formula (Ib) in which Z_5 is different from H comprising:

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- a. the use of a compound as defined in claim 17 and a compound Z_5-Y , in which M refers to an alkali metal salt and Z_5 is as defined in claims 2, 5, 10 to 12 and Y refers to a leaving group; and optionally
 - b. the recovery of the product obtained.

20. Method for preparing a compound having the formula (Ic) comprising:
 - a. the use of a compound as defined in claim 17 in the presence of a halogenation agent; and optionally
 - b. the recovery of the product obtained.

21. Method for preparing a compound according to claim 17 comprising:
 - a) the use of a compound having the formula (A) :



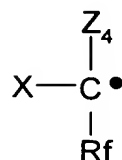
with a mineral acid and a compound $\text{MS}-(\text{C}=\text{S})-\text{Z}_1$ in which Z_1 is as defined in claims 1 to 18 and M refers to an alkali metal and Alk refers to an alkyl group; and, if necessary

- b) the recovery of the product obtained.

22. Method for preparing a compound having the formula (Ia), the method comprising the following successive steps:

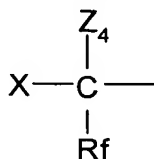
- a) a nucleophilic substitution of the alkoxyl function of the hemiacetal $\text{Rf}-\text{C}(\text{OAlk})(\text{OH})\text{Z}_4$ (A) by means of the addition of a $\text{Z}_2\text{Z}_3\text{NH}$ derivative in order to produce a compound having the formula $\text{Rf}-\text{C}(\text{NZ}_2\text{Z}_3)(\text{OH})\text{Z}_4$, in which Alk refers to an alkyl group and in which Rf, Z_2 , Z_3 are as defined in claims 1 to 18,
- b) a halogenation of the hydroxyl function of the compound produced when step (a) is complete,
- c) a substitution of the halogen group introduced in step (b) by a thiocarbonylsulphonyl derivative in the form of an alkali metal salt, $\text{MS}-(\text{CS})-\text{Z}_1$, in which Z_1 is as defined in claims 1 to 18 and in which M refers to an alkali metal.

23. Use of a compound having the formula (I) in organic radical synthesis, as a source of radicals:



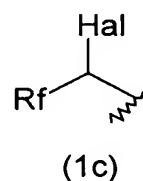
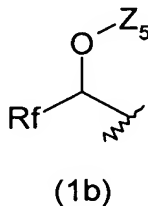
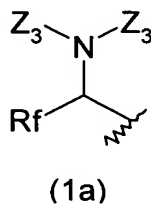
24. Use according to claim 23, characterised in that it is the use of a compound having the formula (Ia) as a source of radicals $(Z_2Z_3N)(R_f)(Z_4)C\cdot$.

25. Use according to claim 23 for introducing to an olefin a group:

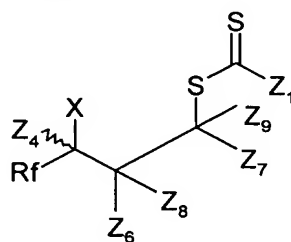


26. Use according to claim 25, for introducing a group $(Z_2Z_3N)(R_f)(Z_4)C-$ to an olefin.

27. Use according to claim 25 for introducing to an olefin one of the following groups:



28. Compound having the formula (II):



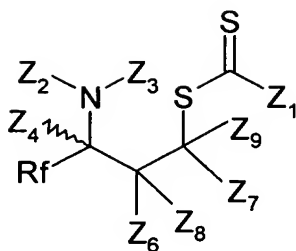
Formula (II)

in which :

- X represents a group which donates by mesomeric effect;
 - R_f represents
 - (i) a halogen atom, preferably fluorine;
 - (ii) halogenoalkyl;
 - (iii) a poly- or per-halogenated aryl radical, or
 - (iv) a radical selected from R_A-CF₂, R_A-CF₂-CF₂-, R_A-CF₂-CF(CF₃)-, CF₃-C(R_A)F- and (CF₃)R_A-, with R_A selected from an alkyl, acyl, aryl, aralkyl, alkene or alkyne group, the cyclic hydrocarbons or the heterocycles,
 - Z₁ and Z₄ are as defined in claims 1 to 18,
 - Z₆, Z₇, Z₈ and Z₉ independently represent a hydrogen atom, a halogen atom, an alkyl, halogenoalkyl, alkenyl, alkynyl, acyl, aryl, arylalkyl, arylalkenyl, arylalkynyl group, or a cyclic hydrocarbon or a heterocycle, a polymer chain, a group -(CH₂)_m-OR^k, -(CH₂)_m-CH(OR^k)(OR^l), CH(OR^k)(OR^l)-, -(CH₂)_m-SR^k, -(CH₂)_m-SO₃R^k, -(CH₂)_m-NO₂, -(CH₂)_m-CN, -(CH₂)_m-R^k, -[(CH₂)_m-P(O)(OR^k)(OR^l)], (CH₂)_m-SiR^kR^lR^m, -(CH₂)_m-COOR^k, -(CH₂)_m-NCOR^k, -(CH₂)_m-NR^kR^l, in which:
 - R^k, R^l and R^m each independently refer to an alkyl, acyl, aryl, alkenyl, alkynyl, aralkyl, alkaryl, alkylsulphonyl, arylsulphonyl group, a cyclic hydrocarbon or a heterocycle,
 - or R^k and R^l form, together with the atom to which they are attached, a cyclic hydrocarbon or a heterocycle;
 - m referring to a whole number which is greater than or equal to 1,
- or Z₆, Z₇, Z₈ and Z₉ form, two by two, one or more cyclic hydrocarbon(s) or heterocycle(s), the groups Z₆, Z₇, Z₈ and Z₉ which do not form a ring being selected from the radicals mentioned above.

29. Compound according to claim 28, in which X represents -NZ₂Z₃, -OZ₅ or Hal group, in which Z₂, Z₃, Z₅ and Hal are as defined in claims 2 to 18.

30. Compound according to either claim 28 or 29, characterised in that it complies with the formula (IIa):



Formula (IIa)

in which Z_1 , Z_2 , Z_3 , Z_4 , Z_6 , Z_8 , Z_9 , Z_7 and R_f are as defined in either claim 28 or 29.

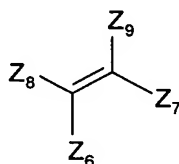
31. Compound according to any one of claims 28 to 30, selected from the following compounds:

- ester of S-[1-(2-acetylamino-3,3,3-trifluoro-propyl)-4-oxo-pentyl] dithiocarbonic acid O-ethyl ester,
- ester of S-[5-(1-acetylamino-2,2,2-trifluoro-ethyl)-2-oxo-[1,3]dioxolan-4-yl] dithiocarbonic acid O-ethyl ester,
- ester of 3-acetylamino-1-ethoxythiocarbonylsulphanyl-4,4,4-trifluoro-butyl acetic acid,
- ester of S-(3-acetylamino-4,4,4-trifluoro-1-trimethyl-silanylmethyl-butyl) dithiocarbonic acid O-ethyl ester ,
- ester of S-(3-acetylamino-1-cyanomethyl-4,4,4-trifluoro-butyl) dithiocarbonic acid O-ethyl ester,
- ester of S-(3-acetylamino-1-diethoxymethyl-4,4,4-trifluoro-butyl) dithiocarbonic acid O-ethyl ester,
- ester of S-[3-acetylamino-1-(1,3-dioxo-1,3-dihydro-isoindol-2-ylmethyl)-4,4,4-trifluoro-butyl] dithiocarbonic acid O-ethyl ester,
- ester of (4-acetylamino-2-ethoxythiocarbonylsulphanyl-5,5,5-trifluoro-pentyl) diethyl phosphonic acid,
- ester of 4-acetylamino-2-ethoxythiocarbonylsulphanyl-5,5,5-trifluoro-pentyl acetic acid,
- ester of S-[3-acetylamino-4,4,4-trifluoro-1-(2-oxo-pyrrolidin-1-yl)-butyl] dithiocarbonic acid O-ethyl ester,

- ester of S-[3-acetylamino-1-[(4-bromo-phenyl) methane-sulphonyl-amino]-methyl]-4,4,4-trifluoro-butyl) dithiocarbonic acid O-ethyl ester,
- ester of S-[1-(2-acetylamino-3,3,3-trifluoro-propyl)-2-phenyl-cyclopropane] dithiocarbonic acid O-ethyl
- ester of 4-benzoylamino-2-ethoxythio-carbonyl-sulphanyl-5,5,5-trifluoro-butyl acetic acid,
- 4-tertbutyloxycarbamate-2-ethoxythiocarbonyl-sulphanyl-5,5,5-trifluoro-pentyl ester of acetic acid,
- O-ethyl and S-(3-tertbutyloxycarbamate-1-diethoxy-methyl-4,4,4-trifluoro-butyl ester of dithiocarbonic acid,
- O-ethyl and S-(3-tertbutyl-oxycarbamate-1-diethoxy-methyl-4,4,4-trifluoro-pentyl) diester of dithiocarbonic acid,
- 3-acetyl-1-ethoxythiocarbonylsulphanyl-4,4,4-trifluoro-butyl ester of acetic acid,
- O-ethyl and S-(3-acetyl-1-diethoxymethyl-4,4,4-trifluoro-pentyl) diester of dithiocarbonic acid,
- O-ethyl and S-(3-acetyl-1-cyanomethyl-4,4,4-trifluoro)butyl ester of dithiocarbonic acid,
- O-ethyl and S-1-(2-acetyl-3,3,3-trifluoro-propyl)-4-oxo-pentyl diester of dithiocarbonic acid,
- 4-[4-bromo-phenyl)-methanesulphonyl-amino]-3-ethoxy-carbonylsulphanyl-1-trifluoromethyl-butyl ester of acetic acid,
- O-ethyl and S-3-chloro-4,4,4-trifluoro-1-trimethylsilanylmethylbutyl diester of dithiocarbonic acid,
- 4-chloro-2-ethoxythiocarbonylsulphanyl-5,5,5-trifluoro-pentyl ester of acetic acid,
- O-ethyl and S-3-chloro-1-(1,3-dioxo-1,3-dihydro-isindol-2-ylmethyl)-4,4,4-trifluoro-butyl ester of dithiocarbonic acid
- O-ethyl and S-1-(2-chloro-3,3,3-trifluoro-propyl)-4-oxo-pentyl diester of dithiocarbonic acid,
- Dimethyl and 4-chloro-2-ethoxythiocarbonyl-sulphanyl-5,5,5-trifluoro-pentyl ester of phosphonic acid,

- O-ethyl and S-3-chloro-1-cyanomethyl-4,4,4-trifluoro-butyl diester of dithiocarbonic acid,
- O-ethyl and S-3-chloro-1-diethoxymethyl-4,4,4-trifluoro-pentyl diester of dithiocarbonic acid,
- O-ethyl and S-3-chloro-1-(4-chloro-phenoxyethyl)-4,4,4-trifluoro-butyl diester of dithiocarbonic acid,
- O-ethyl and S-3-chloro-4,4,4-trifluoro-1-(2-oxo-pyrrolidin-1-yl)-butyl diester of dithiocarbonic acid.

32. Method for preparing a compound having the formula (II), the method comprising the reaction of a compound having the formula (I) with at least one olefin having the formula (III):



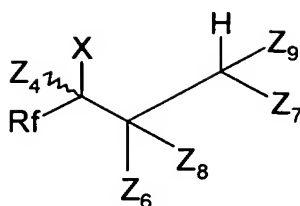
Formula (III)

in which Z_6 , Z_7 , Z_8 and Z_9 are as defined in any one of claims 28 to 31, in the presence of a source of free radicals, in an organic solvent which is inert relative to radicals, and the recovery of the compound having the general formula (II).

33. Method according to claim 32, characterised in that the olefin having the formula (III) used is selected from: vinyl acetate, hex-5-en-2-one, allyl acetate, vinyltrimethylsilane, but-3-enenitrile, 3,3-diethoxypropene, diethyl allylphosphonate.

34. Compound having the general formula (II) which is capable of being produced according to the method as defined in claims 32 to 33.

35. Method for preparing a compound having the general formula (IV):

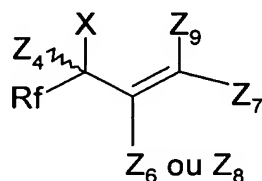


Formule (IV)

in which X , R_f , Z_4 , Z_6 , Z_7 , Z_8 and Z_9 are as defined in any one of claims 28 to 31,

the method comprising the use of a compound having the formula (II) according to any one of claims 28 to 31 in a reduction reaction.

36. Method for preparing a compound having the general formula (V):

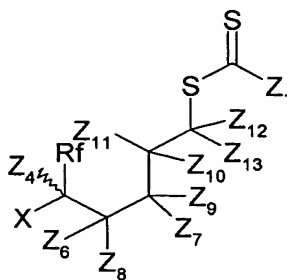


Formula (V)

in which R_f , X , Z_4 , Z_6 , Z_7 , Z_8 and Z_9 are as defined in claims 28 to 31,

the method comprising the use of a compound having the formula (II) in which at least one of the groups Z_6 and Z_8 represents a hydrogen atom according to any one of claims 28 to 31 in a removal reaction.

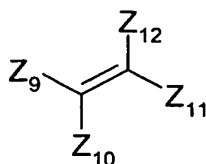
37. Method for preparing a compound having the general formula (VI):



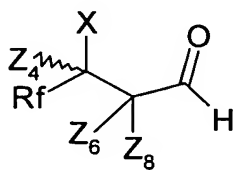
Formula (VI)

in which R_f , X , Z_4 , Z_6 , Z_7 , Z_8 and Z_9 are as defined in claims 28 to 31, Z_{10} , Z_{11} , Z_{12} and Z_{13} complying with the above definitions for Z_6 , Z_7 , Z_8 and Z_9 , the

method comprising the use of a compound having the formula (II) according to any one of claims 28 to 31 in a reaction of radical addition to an olefin having the formula:



38. Method for preparing a compound having the general formula (VII):



Formula (VII)

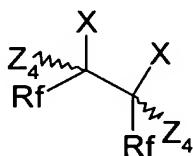
in which R_f, X, Z₄, Z₆, Z₈ are as defined in claims 28 to 31,
the method comprising the reaction of a compound having the formula (II),
in which Z₇ and Z₉ each represent a hydrogen atom and an acyloxy group,
in the presence of an organic or mineral acid.

39. Compound selected from:

- *N*-[3-(2-oxo-pyrrolidin-1-yl)-1-trifluoromethyl-allyl] acetamide,
- *N*-[4-(1,3-dioxo-1,3-dihydro-isoindol-2-yl)-1-trifluoromethyl-butyl] acetamide,
- ester of S-{1-[5-(1-acetylamino-2,2,2-trifluoro-ethyl)-2-oxo-[1,3]dioxolan-4-ylmethyl]-2,2-diethoxy-ethyl} dithiocarbonic acid O-ethyl ester,
- *N*-[1-(5-bromo-1-methanesulphonyl-2,3-dihydro-1H-indol-3-ylmethyl)-2,2,2-trifluoro-ethyl]-acetamide,
- *N*-(3,3-dimethoxy-1-trifluoromethyl-propyl)-acetamide,
- ester of S-{2-[5-(1-acetylamino-2,2,2-trifluoro-ethyl)-2-oxo-[1,3]dioxolan-4-yl]-1-trimethylsilanylmethyl-ethyl} dithiocarbonic acid O-ethyl ester,

- *N*-[1-(5-ethoxy-2-oxo-[1,3]dithiolan-4-ylmethyl)-2,2,2-trifluoro-ethyl]-acetamide,
- 4-benzoylamino-5,5,5-trifluoro-butyl ester of acetic acid,
- 4-acetyl-5,5,5-trifluoro-pent-1-ene,
- ester of 1-[5-bromo-1-methanesulphonyl-2,3-dihydro-1H-indol-3-ylmethyl)-2,2,2-trifluoro-ethyl] acetic acid,
- 2-benzoxy-3,3,3-trifluoro-1-trifluoromethyl-propyl ester of benzoic acid,
- 1-(3-chloro-4,4,4-trifluoro-but-1-enyl)-pyrrolidin-2-one,
- 2-(4-chloro-5,5,5-trifluoro-pentyl)-isoindole-1,3-dione.

40. Compound having the general formula (VIII):



Formula (VIII)

in which X and Z₄ are as defined in claims 1 to 18 and R_f represents

- (i) a fluorine atom;
- (ii) a fluoroalkyl;
- (iii) a poly- or per-halogenated aryl radical, or
- (iv) a radical selected from R_A-CF₂, R_A-CF₂-CF₂-, R_A-CF₂-CF(CF₃)-, CF₃-C(R_A)F- and (CF₃)R_A-, with R_A selected from an alkyl, acyl, aryl, aralkyl, alkene or alkyne group, the cyclic hydrocarbons or the heterocycles.

41. Compound according to claim 40, in which X represents NZ₂Z₃ or OZ₅, Z₂, Z₃ and Z₅ being as defined in claims 2 to 18.

42. Compound according to claim 41, in which X represents -NZ₂Z₃.

43. Method for preparing at least one compound having the general formula (VIII) as defined in one of claims 40 to 42, the method comprising a

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step for radical dimerisation of a compound having the general formula (I) as defined in claims 1 to 18, and the recovery of the compound having the formula (VIII).